

Internal distribution code:

- (A) [-] Publication in OJ
- (B) [-] To Chairmen and Members
- (C) [-] To Chairmen
- (D) [X] No distribution

**Datasheet for the decision
of 21 March 2018**

Case Number: T 1415/15 - 3.2.01

Application Number: 08157043.4

Publication Number: 2058218

IPC: B62K23/06, B62L3/02

Language of the proceedings: EN

Title of invention:

Device to mount control lever to bicycle

Patent Proprietor:

SHIMANO INC.

Opponent:

SRAM Deutschland GmbH

Headword:

Relevant legal provisions:

EPC Art. 56

Keyword:

Inventive step - (yes)

Decisions cited:

T 0204/83

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1415/15 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 21 March 2018

Appellant:
(Opponent)

SRAM Deutschland GmbH
Romstr. 1
97424 Schweinfurt (DE)

Representative:

RLTG
Ruttensperger Lachnit Trossin Gomoll
Patent- und Rechtsanwälte
Arnulfstraße 58
80335 München (DE)

Respondent:
(Patent Proprietor)

SHIMANO INC.
3-77, Oimatsu-cho
Sakai-ku,
Sakai City
Osaka 590-8577 (JP)

Representative:

Grosse Schumacher Knauer von Hirschhausen
Patent- und Rechtsanwälte
Nymphenburger Strasse 14
80335 München (DE)

Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted on 8 May 2015
rejecting the opposition filed against European
patent No. 2058218 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman G. Pricolo
Members: W. Marx
 P. Guntz

Summary of Facts and Submissions

I. The appeal is directed against the decision posted 8 May 2015 rejecting the opposition against European patent No. 2 058 218.

II. The appellant relied on the following evidence filed during the opposition procedure:

- E2: Campagnolo document, "2004 Spare Parts and Tools Catalogue";
- E4: JP 49000642 U;
- E4a: Translation of E4.

The appellant filed the following further evidence with its letter dated 19 February 2016:

- E7: "Dictionary of Modern Technology" - English/German, Vol. 2 J-Z, Oppermann Verlag 1999, page 1529.

III. At oral proceedings held on 21 March 2018 the appellant (opponent) requested that the decision under appeal be set aside and that the European patent be revoked. The respondent (patent proprietor) requested that the appeal be dismissed and the patent be maintained as granted (main request), or auxiliary, that the patent be maintained on the basis of one of the 1st or 2nd auxiliary requests filed with the reply to the grounds of appeal dated 15 December 2015.

IV. Claim 1 as granted read as follows:

"A device to mount a control lever (103) to a bicycle handlebar (1352), the device comprising:
a bracket (101) configured to be connected to the control lever (103) and having an inlet opening (101e) with a center axis (X2), a first tapered portion (101d) extending along the axial direction;

an expanding bolt (105) having a tubular portion (105a) and a fixing member (107) disposed on the tubular portion of the expanding bolt (105),
characterized by the expanding bolt (105) having a second tapered portion (105b) extending along the axial direction, the tubular portion (105a) having an outer threaded surface (813);
and at least one tapered outer serration (513) being formed on the first tapered portion (101d);
wherein the first and second tapered portions (101d; 105b) are configured to operate so as to push the fixing member (107) against an inner surface (1350) of the bicycle handlebar (1352) when the device is mounted to the bicycle handlebar."

V. The appellant's submissions in as far as they are relevant to this decision may be summarised as follows:

Document E4 represented the closest prior art, as it showed nearly all the features of claim 1 and stated the problem to be solved. The subject-matter of claim 1 was distinguished from the device shown in E4 only by "at least one tapered outer serration (513) being formed on the first tapered portion (101d)", i.e. features 1.16 and 1.17 according to the contested decision. E4 described the mounting of the device of E4 to the handlebar (see E4a: page 2, line 25 to page 3, line 12). The pre-assembled unit (comprising expanding bolt 4, bearing 6, washer 7, fixing element 5 and bracket 1) was inserted into the handlebar, until a radially protruding portion of the bracket came to rest on the outer edge of the handlebar. Then, the expanding bolt was screwed into the bracket in order to press the fixing element against the inner wall of the handlebar. E4 already mentioned a screwing torque applied by the expanding bolt to the fixing element and further from

the fixing element to the bracket, frequently leading to the problem of a rotating bracket when screwing the expanding bolt into the bracket, as in the contested patent. Claim 1 was silent as regards the design or function of the outer serration formed on the first tapered portion and did not mention any interaction with further features. Therefore, it was questionable whether it was not already within the customary practice of the person skilled in the art to provide a surface structure as claimed.

The aim of the claimed invention was to reduce the time a mechanic had to hold the bracket during mounting. Fixing the bracket during mounting was also addressed as a problem in E4. As regards the path of torque transfer to the bracket when screwing the expanding bolt to the bracket, E4 already taught to reduce the torque transferred between the expanding bolt and the fixing element by providing a bearing of sliding properties between both parts. However, torque was still transferred to the bracket via a second path of torque transfer existing between the threaded outer surface of the expanding bolt and the bracket's threaded inner surface. As soon as the fixing element was clamped to the inner surface of the handlebar (immobilisation depended on friction coefficient and clamping pressure), it was the connection (i.e. the friction) between the fixing element and bracket which determined whether the bracket rotated when screwing the expanding bolt into the bracket. The problem to be solved starting from E4 was considered as preventing a rotation of the bracket (relative to the fixing element) when screwing the expanding bolt, or more specifically, as providing an increased friction between fixing element and bracket.

The claimed solution was already within the customary practice of the skilled person, who knew that rotation of the bracket could be prevented by increasing the frictional force at the connection to the fixing element. Moreover, such measure was known from E2 showing a corrugated surface (German: "Riffelung") on the first tapered portion of the bracket, which prevented a relative rotation between fixing element and bracket. The term "serration" as specified in claim 1 included in its broadest meaning (see E7) such corrugated surfaces, which were unambiguously derivable from the drawings in E2, representing a mounting instruction for a person skilled in the art. The kinematics of screwing in E2 was slightly different in that the tapered portion of the nut shown in E2 did not rotate. However, the connection between fixing element and bracket was established in the same manner. The problem of torque transfer to the bracket was only partially solved in E4 for a first path of torque transfer via the fixing element. The skilled person would recognise that - applying the teaching of E2 - he could interrupt the second path of torque transfer via the threaded connection by enhancing friction between the fixing element and the tapered portion of the bracket, so that rotation of the bracket was prevented. The description of the contested patent disclosed outer serrations having a specific design. However, outer serrations as known from E2 and provided parallel to the tapered surface of the bracket were to be considered as "tapered serrations" due to the broad meaning of claim 1. The skilled person was competent enough to apply serrations as disclosed in E2 only between parts where it was necessary, so he would not give up the advantage of a reduced friction between the tapered bolt head and the fixing element. Thus, the

skilled person arrived without the exercise of an inventive skill at the subject-matter of claim 1.

VI. The respondent countered essentially as follows:

Irrespective of the public availability of E2, which had not been proven by the opponent, the subject-matter of claim 1 was inventive. Closest prior art document E4 failed to disclose features 1.16 and 1.17 according to the contested decision. Said features did not merely relate to some knurls ("Riffelungen") being provided on the first tapered portion of the bracket to enhance friction, but related to a toothing structure having a specifically claimed design. The serration as claimed ("a tapered serration being formed on the first tapered portion") was tapered twice, in particular "V-shaped" in axial direction (Figures 5A, 9; paragraph [0016]).

The distinguishing features provided the advantages that bracket rotation relative to the handlebar during mounting was prevented, that assembly of the device (when bringing the tapered serration into contact with the fixing member) was facilitated due to the tapered serration broadening in axial direction, and that the tapered serration engaged with the fixing member prevented rotation of the fixing member with the bolt. During a conventional mounting procedure the bracket was held while turning the expanding bolt via a tool.

In order to have the outer surface of the fixing member contacting the inner surface of the handlebar, the expanding bolt had to be largely screwed into the device, so the friction between the threads of screw and bracket had already been exceeded and serrations were not needed any more to solve the problem. Thus, the mentioned "second way of torque transfer" (due to

the thread of the bolt engaging the thread of the bracket of E4) was not affected when serrations were provided on the tapered surface and, in addition, negligible in reality. Even assuming that the threading friction was indeed high to transfer torque, the entire apparatus would turn when screwing the expanding bolt. Moreover, taking into account how the apparatus was mounted, the mechanic would grip and hold the bracket until the bolt was fastened with the required amount of torque, not only until the fixing member contacted the inner peripheral surface of the handlebar. Hence, the technical problem could not be defined as done by the appellant, but was to be seen in that the device allowed for easy mounting to the handlebar by inhibiting movement of the fixing member together with the expanding bolt. The skilled person starting from E4 would not solve this problem, which was already solved in E4 by providing a washer having a high sliding capability between bolt and fixing member. There was no incentive for the skilled person to contemplate the use of friction enhancing means provided on the tapered portion of the bracket in E4, since the solution according to E4 allowed the entire apparatus to be mounted without fixing the bracket to the handlebar (page 3, lines 4-12), thus eliminating the former problem (page 3, lines 17-18). Thus, the skilled person would not consider E2 at all. Besides, if friction in the thread connection was an issue, he would apply measures as already foreseen in E4, i.e. reduce friction (e.g. by greasing the thread) or hold the bracket.

If the skilled person were to consider E2, the subject-matter of claim 1 was inventive for several reasons. The drawing of E2 was highly ambiguous and lacking a clarifying description, so it was not possible to

derive a technical teaching therefrom (see T 204/83). It was questionable what the lines (which the appellant pretended to be serrations, but might be a mere aesthetic representation) actually denoted and how the device shown in E2 was working. But even assuming that the lines shown in E2 denoted serrations, it was not derivable from E2 that tapered serrations were formed on the first tapered portion of the bracket. Moreover, even if the skilled person could derive a clear technical teaching from E2, he would still fail to arrive at the subject-matter of claim 1. As confirmed by the appellant, the problem would only be solved in case the fixing member already contacted the handlebar, but then there was no need to rotate the screw any further and no motivation to provide any serration on the tapered surface, which was useless to inhibit rotational movement transferred through the threads.

The skilled person would not segregate the teaching of E2, which also prevented the nut member from disengaging the fixing member (i.e. from rotating) when the device was mounted and the screw was tightened, and provide serrations only on the first tapered portion of the bracket. This teaching of E2 was incompatible with E4, according to which friction was reduced at the corresponding connection, as acknowledged by the appellant. Applying the entire teaching of E2 to the expanding bolt of E4 led to a non-working embodiment as the bolt of E4 could not be turned any longer.

Reasons for the Decision

1. The subject-matter of claim 1 as granted involves an inventive step (Article 56 EPC).

1.1 Document E4 represents the closest prior art and was the appellant's sole starting point for attacking inventive step of granted claim 1.

E4 discloses (see Figure 3) a device to mount a control lever (2) to a bicycle handlebar comprising:

- a bracket (1) configured to be connected to the control lever (2) and having an inlet opening (12b) with a center axis, a first tapered portion (12a) extending along the axial direction;
- an expanding bolt (4) having a tubular portion and a second tapered portion (4a) extending along the axial direction, the tubular portion having an outer threaded surface (4b);
- a fixing member (5) disposed on the tubular portion of the expanding bolt (4).

The device known from E4 also provides the function as specified in claim 1, i.e. the first and second tapered portions (12a, 4b) are configured to operate so as to push the fixing member (5) against an inner surface of the bicycle handlebar when the device is mounted to the bicycle handlebar (see E4a, page 4, lines 31-34).

1.2 E4 does not show at least one tapered outer serration being formed on the first tapered portion (12a), as required by claim 1 and as agreed by the parties. Thus, novelty of the claimed subject-matter is acknowledged.

1.3 Since claim 1 does not further specify the at least one outer serration - apart from being tapered - as regards its shape or function, the board adopts a broad interpretation of the term "serration" which includes corrugated surface structures, e. g. ruffles or knurls. Such non-smooth surface structures result in increased friction coefficients and thus enhanced friction when interacting with a further part.

As regards the device known from E4 and its mounting to the handlebar, friction characteristics between the fixing element and the bracket play a role when the fixing element is clamped within the handlebar and remains immobile when further tightening the bolt. Until then, no torque is transferred via the expanding bolt to the fixing element according to the teaching of E4 in view of a slidable bearing provided between the bolt and the fixing element. During this phase, any torque transfer via the threaded connection between bolt and bracket - which would cause a rotation of the bracket - has to be compensated by manually fixing the bracket, irrespective of whether the fixing element would also start rotating or not. The frictional condition between fixing element and bracket has an effect only when the torque transferred to the bracket via the threaded connection is lower than the clamping force of the fixing element within the handlebar, so that the immobile fixing element would be able to prevent rotation of the bracket, provided that the connection between fixing element and bracket can provide the required friction force. This friction force acting between contacting surfaces of the fixing element and the bracket, however, is not only dependent on the friction coefficient, but also on the normal force acting on the surfaces, which is produced by the tensional force of the expanding bolt and depends on the inclination of the tapered surfaces. Therefore, the board has already serious doubts whether starting from E4 a situation arises which might require enhanced friction between the fixing element and the bracket.

- 1.4 Nevertheless, assuming that the distinguishing features of claim 1 contribute to prevent a rotation of the bracket in a final phase of the mounting procedure as

known from E4, the technical problem has to be chosen as specific as possible but without containing elements or pointers to the solution.

It is noted that the problem as formulated by the appellant ("providing an increased friction between fixing element and bracket") contains a pointer to the solution of increasing the friction coefficient (e.g. by providing non-smooth surfaces, as explained above) and cannot therefore be accepted. The same applies to a formulation of the problem according to the contested decision ("prevent the bracket from rotating with respect to the fixing member") which might suggest a form-fit connection and therefore gives a hint in direction of the claimed solution of providing a serration on the tapered portion of the bracket.

Therefore, the board finds that the objective technical problem can be seen in further preventing rotational movement of the bracket during mounting of the device to the handlebar, as formulated by the appellant in its grounds of appeal.

- 1.5 E4 already teaches that rotation of the bracket during mounting (when screwing the expanding bolt into the bracket) can be prevented by providing a slidable connection, namely a bearing of sliding properties between the tapered portion of the expanding bolt and the intermediate fixing member, so that torque transfer via the fixing member to the bracket is eliminated. Thus, as argued by the appellant, a first path of torque transfer to the bracket via the fixing element is eliminated by this measure, which provides different friction conditions on the two sides of the fixing element joining the expanding bolt and the bracket.

Following the appellant in that in the final phase of mounting, i.e. when the fixing element is already clamped within the handlebar and the expanding bolt is tightened further, a second path of torque transfer via the threaded connection between bolt and bracket might be established, a torque would be applied to the bracket when further tightening the expanding bolt.

However, the board cannot see any indication in E4 and therefore no motivation for the skilled person starting from E4 to contemplate changing the design or shape of the tapered surface of the bracket. First of all, there is no indication to be found in E4 that the connection between bracket and fixing element might be poorly designed so that slipping would occur when screwing the expanding bolt. Due to a rather high inclination angle of the tapered surface of the bracket with respect to the longitudinal axis of the bolt, the normal forces produced when tightening the bolt are already rather high, which contributes to high friction forces. There is no indication that the frictional force between the fixing element and the bracket might become lower than the clamping force between the fixing element and the handlebar, which would be the only situation that could be improved by providing friction enhancing means between the fixing element and the bracket. Moreover, the bracket is not only supported on the fixing element clamped to the handlebar, but rests with a radially protruding portion also on the outer edge of the handlebar, as noted by the appellant. Thus, further tightening of the expanding bolt produces also higher friction forces directly between the bracket and the handlebar. Furthermore, the only teaching of E4 with regard to the problem stated above relates to friction reducing measures in case of undesired torque transfer, such as reducing torque transfer in the threads.

In view of the foregoing, the board holds that the provision of an outer serration on the tapered surface of the bracket is not an obvious solution the skilled person would contemplate based on his knowledge starting from E4. The skilled person would only arrive at the claimed invention with hindsight.

- 1.6 As regards the alleged combination of E4 with E2, the board finds that the designs of both devices for mounting a control lever are incompatible with each other, so the skilled person would not consult the teaching of E2. On the assumption that a friction enhancement structure is derivable from the drawings of E2 (see lines on the tapered surface of the bracket, and also on the inner surface of the fixing element which cooperates with a nut member), the skilled person would conclude that E2 aims at fixing all three parts relative to each other before placing them into the handlebar opening. This is also technically required to prevent rotation of the nut member, since in E2 a screw is screwed from the opposite side through the bracket and the fixing member to the nut member. By contrast, in E4 the nut member is replaced by an expanding bolt which is screwed through the fixing member directly into the bracket, i.e. rotation of the bolt within the handlebar is essential for mounting the device.

Therefore, the only teaching the skilled person might take from E2 is that immobilisation of two parts relative to each other can be achieved by providing surfaces having enhanced friction characteristics. However, this teaching forms already part of the basic knowledge of the person skilled in the art, in the present case a mechanical engineer. With same reasoning as above, since there is no incentive to apply this

knowledge to the tapered portion of the bracket in E4, the subject-matter of claim 1 is considered inventive.

The appellant argues that the skilled person would learn from E2 that he could interrupt the second path of torque transfer via the threaded connection in E4 by enhancing friction between the fixing element and the tapered portion of the bracket. However, the crucial question to be answered when assessing inventive step is not whether a skilled person could have modified the device of E4, but whether he would have been prompted to do so. Again, for the reasons given already above, the board cannot see any motivation for the skilled person to provide modifications in the device known from E4 so that he would arrive at the subject-matter of claim 1.

- 1.7 Therefore, starting from E4 as the closest prior art, a modification of the known device as specified by granted claim 1 is not obvious in view of the knowledge of the person skilled in the art and also when taking into account the teaching of E2.
2. The above considerations are based on the assumption that document E2 was available to the public, which was contested by the respondent. Since E2 cannot prejudice inventive step of the subject-matter of claim 1 as granted, the question of public availability of E2 can be left open.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated